

The John Oliger Co.  
11601 Whidbey Dr.  
Cumberland, IN 46229

PRODUCT LIST. All prices include First Class postage/packing-USA and Canada only.  
Indiana residents add 5% sales tax. Canadian orders must include money order payable in US \$.

All projects are designed for the ZX computer electronics experimenter/hobbyist with at least some experience at electronics kit building. All pc boards except the power supplies are double sided with edge connector "fingers", and are meant to be used in either expansion board below. All boards are hand made in-house, are G-10 or FR-4 epoxy material + have solder plated traces. All are completely cut and drilled, but none feature plated through holes-feedthrough wires must be installed by the user. There is a 10 day money back satisfaction guarantee on all my products if the product is returned AS RECEIVED in that amount of time. Exchanges will also be honored in the 10 days, too, if sufficient funds for the return postage of the exchanged product are sent with the return. No returns or exchanges will be accepted after 10 days of your orders receipt.

64K DYNAMIC RAM      Bare pc board:\$19.95      Board w/parts ex. ram:\$34.95  
This project, featured in SQ#3, (Xerox copy avail. @ \$2.50pp) is a full feature 64K ram. Special features of this memory not found on other 64K memories include: 8-12K on/off switch, 12-16K on/off switch, two banks of 8K ram avail. mapped 8-16K (Bank A/B switch), 48-64K on/off switch. Circuit uses "pin 1 refresh" type 4164 chips for reliable refresh and IS compatible w/TS1000.

PARALLEL PRINTER PORT      Bare pc board:\$10.00      Board w/parts:\$20.95  
This project was detailed completely in SQ#s 1&2, and the reading of this two part article is a must for the project builder. (Xerox copy of this article avail. @ \$5.00pp) The actual port is memory mapped at location FFFFh, and is a bi-directional port. (Both sending to the printer and reading the printer status supported) This board includes only its' schematic, a theory of operation sheet, and a mc listing w/comments of a copy screen routine, for use with the Okidata printers. The circuit and software can be adapted to most other "Centronic" type printers. To achieve full use of the Basic printer commands, part of the Sinclair rom must be patched by putting it on eeprom. (Detailed in the article) Thus access to an eeprom programmer and reader is a must to make the port user transparent. (Requires rom + ram decode via use of 64K mem, etc)

2716 EPROM PROGRAMMER      Bare pc board:\$10.00      Board w/parts (ex. eeprom):\$22.95  
This programmer was also described in SQ#s 1&2, so this article is recommended reading on this one, too. The programmer is memory mapped at 2000-27FFh and programs easily from Basic by simply POKing the desired data to one of the eeproms' locations. The programmer has its own latches on-board and does NOT use the Z80 WAIT NOT input, thus ram refresh problems are completely avoided. In the interests of simplicity, this programmer does not include verify circuitry. A source of 25VDC is required for the 2716s programming voltage. (Vpp supply, below, recommended) This board includes only its' schematic and a Basic programming example sheet. This board may also be used directly on the TS2068 computer without any modification. (Rom decode required for TS1000/ZX-81)

2764 EPROM PROGRAMMER      Bare pc board:\$10.00      Board w/parts (ex eeprom):\$22.95  
This programmer is identical to the 2716 programmer above, except for the following: The circuit has been changed to accept 28 pin 2764 eeproms : The eeprom is mapped 2000-3FFFh : 21VDC is now required for the programming voltage. (Avail. from Vpp supply, below) This board comes with its' schematic, assy instructions, and a theory of operation sheet. If this board is ordered along with a 2764 \* 2 read board (below), a copy of an unpublished article on using these boards as "cartridge" boards is included with the order at N.C. This programmer can be used on the TS2068

Vpp POWER SUPPLY      Bare pc board:\$4.49      Board w/pc mounting parts:\$9.95  
This small single sided board provides 4.4, 21, and 25VDC for use with either programmer above. This circuit is designed to put as little stress on the eeprom as possible during programming and is recommended for use with the above programmers. Board is supplied with schematic, assembly instructions, and use instructions. Parts kit does NOT include transformer or power cords.

2716 \* 4 EPROM READER      Bare pc board:\$10.00      Board w/parts (ex eeprom):\$14.95  
This board, also described in SQ#s 1&2, can hold up to four 2716 eeproms mapped 8-16K. The board can be modified (details included) to accept 6116 type static ram chips along with eeprom, if desired. Its' purchase includes its' schematic and the mod sheet for 6116 use. (Req. rom decode)

2764 \* 2 EPROM READER      Bare board:\$10.00 or 30\$25.95      Board w/parts:\$14.95 or 30\$38.95  
While small in size and complexity, this board is versatile in that it is capable of mapping either of its' 2764 eeproms anywhere in the 64K map in 8K blocks. (Within reason) This board is intended to be used as a "cartridge", if desired, for storing Sinclair programs on eeprom and its' purchase includes a copy of this article if the 2764 programmer is also ordered. This one comes with its' schematic, assy instructions, and a theory of operation sheet. Rom decoding and ram decoding is required. This circuit can itself decode the rom if one jumper is installed.

MEMORY ACCESS MONITOR      Bare pc board:\$5.00  
This very small board is a very simple circuit that simply indicates via the use of eight LEDs where in the 64K memory map the Z80 cpu is READing or WRITing. The circuit uses only one ic, and is extremely easy to assemble. Although this circuit does not actually do anything, it can be very useful in debugging hardware projects and mc programs that cause the computer to crash, by indicating where the cpu is after the crash. Only a schematic is included with this one because it is simple enough to require only this for construction. This circuit works also on the TS2068

THANK YOU

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NEW PRODUCTS FOR THE TS2068 COMPUTER

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2068 USER CARTRIDGE BOARD      Bare pc board:\$10.95      Board w/parts (ex eprom):\$15.95

This board is designed to plug into the cartridge (Dock) port of the 2068 computer. The board holds two 2764 or 27128 eproms and allows the 2068 computer owner to store his own Basic programs in cartridge form for fast and easy access. The 2764 programmer for the ZX81/TS1000, listed on the main product list, is required at this time to program 2764 eproms for use on this board, but a 2764/27128 programmer designed specifically for the TS2068 is in the works and will be available shortly. The boards' purchase includes instructions for its' use and schematic.

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4-SLOT 2068 EXPANSION BOARD      Bare pc board:\$14.95      Board w/parts:\$43.95

This compact (3 3/4" \* 4 3/8") expansion board is designed to plug into the rear expansion connector of your 2068 computer. Its' four "slots" can be used for future boards for your 2068 from The John Oliger Co., or immediately with the TS1000 eprom programmers available that are compateable with the 2068 (see main product list). The board includes one "spare" 20 pin ic socket for user circuits, a rear edge connector feedthrough for attaching the 2040 printer, modem, etc., and the nec. circuitry for an ultra stable RGB monitor interface. (NOTE: The use of the RGB circuitry requires opening your 2068, cutting one trace, and installing one jumper.) The boards' purchase includes assembly instructions and a schematic of the RGB interface. The parts kit for this board includes five precut and slotted edge connectors, 2 IC sockets, 1 74HC00 IC, 1 47K resistor, and the nec. feedthrough wires for the boards' construction.

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COMING SOON FOR THE TS2068!!!

2764/27128 EPROM PROGRAMMER FOR THE 2068

CENTRONICS TYPE PAR. PRINTER INTERFACE FOR THE 2068